DOCUMENT RESUME

ED 432 776 CS 216 823

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TITLE Extending Interactions with Non-fiction Texts: An Exit into Understanding.
PUB DATE 1999-00-00
NOTE 16p.
PUB TYPE Guides - Non-Classroom (055)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comprehension; Elementary Education; Models; *Nonfiction; *Reader Text Relationship; *Reading Instruction; *Reading Strategies; Teaching Methods

ABSTRACT

Exploring ways of helping teachers to extend their pupils' literacy, this paper's intent is to devise and try in classrooms a range of strategies whereby teachers might develop the abilities of their children to use literacy more effectively as a means of learning. It gives an outline of the model used, the Extending Interaction with Texts, or "EXIT" model, and briefly outlines the thinking and research underlying the model. The paper concludes that despite the difficulties in devising models of this nature, teachers have reacted positively to the attempt to provide a framework for their classroom work. Contains 30 references. (SC)

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ED 432 776

Extending Interactions with Non-fiction Texts: An Exit into Understanding

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Extending interactions with non-fiction texts: An exit into understanding

David Wray and Maureen Lewis

Introduction

Over the past six years we have been involved in a project funded by the Nuffield Foundation which has been exploring ways of helping teachers to extend their pupils' literacy. The main focus of the Nuffield Extending Literacy (EXEL) project has been to devise and trial in classrooms a range of strategies whereby teachers might develop the abilities of their children to use literacy more effectively as a means of learning. Our work has, therefore, tended to concentrate upon the reading and writing of non-fiction, or expository, text, an area which has been rather neglected in the past in terms of both research and the development of practice.

Central to our work on this area has been our attempt to establish a theoretical basis for teaching children how to learn with texts. An essential part of this theoretical base has been a developing model of the processes involved in this learning. In this paper we shall outline our model, christened the Extending Interactions with Texts, or EXIT, model and briefly outline the thinking and research underlying it. The model has been extensively revised over the period we have been working on it and is at present in a reasonably stable form. We must stress, however, that it is offered here only as a tentative account of the processes of learning from, through and with texts.

A brief history of models

The processes we are discussing here have tended to be described in the literature as "information skills" and, in that they refer to the processes of locating and dealing with the information given in texts in a range of media, this is a useful descriptor. We are concerned, however, that the use of this term, and linked terms such as "information reading" and "study reading", tends to indicate a separation of these ways of interacting with texts from ways more generally referred to as "reading". As Cairney (1990) has argued, theories about the understanding of written text which characterise it as a process of information transfer, that is as "getting the information from the text", are strongly contradicted by more recent conceptualisations of the reading process as one of transaction, that is, the active construction of meaning in negotiation with the text as written (cf. Rumelhart, 1985; Goodman, 1985). Thus any model aiming to describe the process of interacting with expository texts must account for its transactional nature and build in a strong element of the reader contributing to the constructed meaning.

The above remarks notwithstanding, almost all the attempts which have so far been made to elaborate more fully what happens when we read and learn from

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expository texts have tended to term themselves as descriptions of the "information process". This is not to say that all these attempts have nothing to offer a more extended and interaction-based description of this process. Many of the elements described in information skills models have relevance to interactive models of the reading to learn process.

There have certainly been no shortage of models (or, more usually, lists of skills) put forward with the intention of helping teachers plan more thoroughly for their teaching of children's use of textual information. Of these models, two have been particularly influential in our thinking around this issue. The first was an attempt to describe the "information process" in terms of six stages of activity (Winkworth, 1977). These six stages were used by Wray (1985, 1988) to form a basis for advice to teachers on the teaching of information skills through class project work. The stages were:

> Defining the subject and the purpose of the enquiry Locating information Selecting information Organising information Evaluating information Communicating the results

This formulation was used, in a slightly amended form, by Tann (1988) who, in discussing the teaching of information skills through project work, defined these as:

> identifying the information that is wanted, selecting possible sources of information, locating the information, extracting and recording information, interpreting/ integrating/ interrogating information, presenting findings.

Both these six stage models are useful as guides for teachers to the processes through which their children might go as they pursue project enquiries. They both suffer, however, from the major problem that they are certainly incomplete. They lack what we now feel to be the crucial element of the actual interaction with a text. In the terms of these models, what happens when a reader faces the words on the page of an appropriate text is limited to selecting, extracting and recording information. As argued earlier, this now seems inadequate as a description of the multi-faceted transaction between a reader, coming to a text with a whole range of attitudes, feelings and arrays of knowledge, and the words on a page, created by an author with a range of intentions many of which go beyond the simple passing on of information.

A second formulation of the information process which has been widely quoted and used, particularly in secondary school contexts, was that of the Schools' Council working group under the chairmanship of Marland (Marland, 1981). Marland's group tried to break down the process of a secondary school pupil carrying out an assignment involving the use of information. They suggested nine steps, which were phrased as nine questions, as follows:

- 1. What do I need to do?
- 2. Where could I go?
- 3. How do I get to the information?
- 4. Which resources should I use?
- 5. How shall I use the resources?
- 6. What should I make a record of?
- 7. Have I got the information I need?
- 8. How should I present it?
- 9. What have I achieved?

A particular strength of the way these steps are formulated is that, as pupils are asked questions as they proceed with their assignments, they are given the opportunity to consider directly the processes of their own learning and thinking. They are therefore encouraged to take a metacognitive stance on their own activities, a feature which, as will be argued later, is a necessary part of serious attempts to extend learners' control over their own thinking with texts. The nine questions are still, however, inadequate in their reduction of the text-reader transaction to "How shall I use the resources?"

Because of such problems with existing models of the learning with text process, we felt we needed to reconceptualise this process. The EXIT model represents the state of our thinking at this point.

The EXIT model

In presenting the model we are immediately faced with the difficulty of representing a complex and essentially recursive set of processes in the two-dimensional space defined by print on paper. Although in what follows the model will be represented as a series of numerical stages, it is important to realise that this is for convenience only. We do not intend the model to be read as a linear description of what happens when we interact with information texts.

We see the process of learning from, with and through texts as involving ten kinds of mental activities, as follows.

1. Elicitation of previous knowledge.
2. Establishing purposes.
3. Locating information.

4. Adopting an appropriate strategy
5. Interacting with text
6. Monitoring understanding
7. Making a record
8. Evaluating information
9. Assisting memory
10. Communicating information

Each of these "stages" can, following the Marland model earlier described, be expressed as a question and be thus available to children themselves as a guide for their thinking. This model is given below. We shall give a brief description of and rationale for each of the ten "stages" and also, briefly, give some indication of some appropriate teaching strategies although we have in written in much greater detail elsewhere about these.

1. Elicitation of previous knowledge.

It has become quite clear from learning theory that, in order for any real learning to take place, we have to draw upon knowledge we already have about a subject. The more we know about the subject, the more likely it is that we shall learn any given piece of knowledge. Brown (1979) has described this as "headfitting", by which is simply meant that the closer the distance between what is already known by the learner and the particular information to be learnt, the more likely it is that learning will be successful. Learning which does not make connections with our prior knowledge is learning at the level of rote only, and is soon forgotten once deliberate attempts to remember it have stopped. (Most people can remember times they learnt material in this way, usually as preparation for some kind of test: once the test was over, the information "went out of their heads".)

Learning has been defined as "the expansion and modification of existing ways of conceiving the world in the light of alternative ways" (Wray & Medwell, 1991, p 9). Such a constructivist approach to learning places great emphasis upon the ways in which prior knowledge is structured in the learner's mind and in which it is activated during learning. Theories about this, generally known as schema theories as they hypothesise that knowledge is stored in our minds in patterned ways (schema) (Rumelhart, 1980), suggest that learning depends, firstly, upon the requisite prior knowledge being in the mind of the learner and, secondly, upon it being brought to the forefront of the learner's mind. Any model, therefore, which attempts to act as guide for teachers to develop their children's abilities to learn from texts, must include an emphasis upon the need to elicit what the learners already know about the topics of these texts. In practical terms this might be achieved through the use of such activities as engaging children in discussion,

brainstorming and subsequently concept-mapping what they know about a topic, and the use of KWL grids (What do I Know?, What do I Want to know?, What have I Learnt?) (Ogle, 1989).

2. Establishing purposes.

A crucial part of the process of learning from texts must involve the specification of just what information is required from these texts and why. If this is not done, then subsequent interactions with texts will tend to be haphazard rather then purposeful. For many primary school children, however, an initial purpose for reading will often consist of nothing more than a vague statement such as 'I want to find out about dinosaurs (or birds, or trains etc)', which is certainly not precise enough to be useful to them. Statements like this have two logical consequences. Firstly they give no criteria for judging the usefulness of any information which is found. If it is about dinosaurs (or birds etc.) then it must be relevant. Secondly there is no indication of when the process of finding information should stop. Children could go on for ever finding information about dinosaurs (etc.) and still be no nearer satisfying this vague purpose.

Children need to be encouraged to specify as precisely as possible what it is they want to find out, and what they will do with that information when they have found it. They may be asked to draw up a list of questions to which they want to find answers, or tasks which they aim to complete. A more useful purpose might be something like this: 'I want to find out the relative sizes of the most common dinosaurs so I can draw scale pictures of them on a wall chart'. This defines the area and clearly specifies what they will do with the information once they have found it.

One of the National Curriculum statements of attainment for English, level 3 (DES, 1990) states that children should "Devise a clear set of questions that will enable them to select and use appropriate information sources and reference books from the class and school library." Such question-setting is itself not unproblematic, but its key function of making work with non-fiction texts more purposeful is of undeniable importance. We should bear in mind, however, that question-setting may not always occur at the beginning of a project. The EXIT model is not intended to be seen as linear in its operation and it is quite likely that question-generation will occur and reoccur as the project progresses.

3. Locating information.

Clearly in the world outside school, the texts which will help meet the reading purposes children have defined will not be simply presented to them as a package. They will need to find the information they require in libraries, books or whatever sources are appropriate. This will involve knowing how to use a library system to track down likely sources of the information required, how to find information efficiently in books and other sources (using index and contents pages, for

example), but also how to use the most important information resource - other people. To this list must also be added the skills of using the various tools of information technology to retrieve needed information. Teletext televisions, computer data-bases and the Internet are all extremely useful sources of information in the classroom, but not unless the children possess the requisite skills for using them. For the National Curriculum statement of attainment English level 4 (DES, 1990) children should be able to 'Locate books or magazines in the class or school library by using the classification system or catalogue, and use simple information - retrieval strategies when pursuing a line of enquiry.'

These location skills are not actually terribly complicated, yet children and adults alike often seem to have difficulties in using them. From our own research (Wray & Lewis, 1992) it is very common for children to be able to explain perfectly well how to use an index to a book, for example, but then, when left to their own devices, to prefer to leaf through a book instead. There appears to be a problem of transfer of learning here as the children we studied had certainly been taught about locating information in books and libraries. They had just not transferred this knowledge into action. We would suggest that the solution to this problem is to make sure that children are taught to locate information within the context of actually doing it, usually as part of an investigative project. If this is done, children will be much more likely to use browsing as a deliberate strategy in book use rather than as their only strategy.

4. Adopting an appropriate strategy.

It is clear that efficient readers modify the ways they read according to their purposes for reading, the nature of the texts they are faced with and the context in which they interact with these texts. Compare, for example, the different ways the following reading tasks would usually be approached.

(i) Finding a telephone number in the Yellow Pages.
(ii) Reading a newspaper over the breakfast table.
(iii) Studying a text book chapter in preparation for a test.

In the first example, the reading would involve glancing over several pages of text looking for a particular word or group of words. When this was found, a closer reading of the particular item of information would follow. This reading strategy we generally refer to as 'scanning'.

In the second example, the major part of the reading would involve the rapid browsing through large portions of text, gaining a fairly general picture of what the items and articles were about. Some of these items would probably receive more detailed attention than others, but most would not be read in close detail. This approach to reading is usually termed 'skimming'.

The third example is very different in that it would probably involve the close

reading, and perhaps re-reading several times, of every word in the chapter. Such 'intensive reading' is comparatively rare in non-educational settings, but where it is appropriate, it is usually very important that it is done effectively.

From research into the capacity of readers of various kinds to monitor and control their own reading behaviour (Wray, 1994) it appears that one of the things which distinguishes effective from less effective readers is the ability to take appropriate, and conscious, decisions about which reading strategy to adopt in which circumstances, and when to switch strategies. This suggests that if we want young readers to become more effective, we need to give some attention to helping them widen their control of a range of reading strategies. Children need to "be shown how to read different kinds of materials in different ways" (National Curriculum for English programmes of study for reading, DES, 1990) but also to make decisions for themselves about the appropriate strategies to use in particular situations. We suggest that an important teaching strategy towards this is for the teacher to demonstrate appropriate ways of behaving, that is for the teacher to model how he/she reads a particular information source, thinking aloud as he/she does it so that children can gain an understanding of how and why reading strategies are selected.

5. Interacting with text.

The above processes are, we would argue, crucial to the effective use of reading to learn and, in many ways, the success of the actual "eyeball-to-text" part of the process depends upon them. Nevertheless, it is the stage of interacting with the text which remains at the heart of the whole process. Here the reader engages in an intricate transaction with the printed symbols, constructing a meaning, or meanings, on the basis of what he/she brings to the text - knowledge, beliefs, attitudes - and the intended message of the author of that text. In order to help young readers engage in this process more successfully, we suggest that teachers might employ strategies which focus children's attention on the ways in which texts are constructed and the ways in which their meaning is created and might be recreated. Activities such as cloze procedure, sequencing and text restructuring, given the generic title of DARTs (Directed Activities Related to Texts), have been quite extensively researched (Lunzer & Gardner, 1984; Wray, 1981) and appear to be useful in enabling this interaction with text. Other strategies, such as text marking (by underlining, highlighting or numbering), have not been so widely researched but our classroom work suggests they have some success in helping children focus on the sections of texts most relevant to their reading purposes.

6. Monitoring understanding.

Current theories of reading tend to converge in suggesting that an important element of the comprehension process is the reader's ability to monitor his or her own understanding as it develops in interaction with a text, and to take remedial action in the event of comprehension problems. According to Brown (1980), such

an 'aware' approach to one's own reading will involve:

a) clarifying one's purposes for reading, that is understanding the explicit and implicit demands of a particular reading task,

b) identifying the important aspects of a text,

c) focussing attention on these principal aspects rather than on relatively trivial aspects,

d) monitoring on-going activities to determine whether comprehension is taking place,

e) engaging in self-questioning to check whether the aims are being achieved,

f) taking corrective action if and when failures in comprehension are detected.

Reading for meaning therefore involves the metacognitive activity of comprehension monitoring, which entails the use of what have been called 'debugging' skills (Brown, 1980).

Although mature readers typically engage in comprehension monitoring as they read for meaning, it is usually not a conscious experience. Brown (1980) distinguishes between an automatic and debugging state. Skilled readers, she argues, tend to proceed on automatic pilot until a 'triggering event' alerts them to a failure or problem in their comprehension. When alerted in this way they must slow down and devote extra effort in mental processing to the area which is causing the problem. They employ debugging devices and strategies, all of which demand extra time and mental effort. Anderson (1980) suggests that efficient readers need not devote constant attention to evaluating their own understanding and he suggests the existence of an 'automated monitoring mechanism' which 'renders the clicks of comprehension and clunks of comprehension failure'.

Realising that one has failed to understand is only part of comprehension monitoring; one must also know what to do when such failures occur. This involves the making of a number of strategic decisions. The first of these is simply to decide whether or not remedial action is required. This seems to depend largely upon the reader's purposes for reading (Alessi, Anderson & Goetz, 1979). For example, if a reader's purpose is to locate a specific piece of information, a lack of understanding of the surrounding text will not usually trigger any remedial action. On the other hand, if the purpose is to understand a detailed argument, then practically any uncertainty will spark off extra mental activity.

In the event of a decision to take action, there are a number of options available. The reader may simply store the confusion in memory as an unanswered question (Anderson, 1980) in the hope that the author will subsequently provide sufficient clarification to enable its resolution, or the reader may decide to take action immediately, which may involve rereading, jumping ahead in the text, consulting a dictionary or knowledgeable person, or a number of other strategies (Baker &

Brown, 1984).

Numerous research studies have examined children's monitoring of their own comprehension and it is possible to draw some fairly firm conclusions. According to Garner (1987), "The convergent findings from recent research can be summarised: Young children and poor readers are not nearly as adept as older children / adults and good readers, respectively, in engaging in planful activities either to make cognitive progress or to monitor it. Younger, less proficient learners are not nearly as 'resourceful' in completing a variety of reading and studying tasks important in academic settings" (p. 59).

It seems that one important area upon which the teaching of reading to learn needs to focus is children's awareness of their own understanding as they read. As with the adoption of an appropriate reading strategy, we suggest that the most effective teaching strategy for this is for teachers actively to demonstrate to children their own thinking/monitoring processes as they try to understand a text. It has been demonstrated that the systematic use of such thinking-aloud can have significant effects upon children's abilities to understand what they read (Palincsar & Brown, 1984).

7. Making a record.

In adult everyday life, a search for required information will not always result in any written record: the adult may simply remember the information or act upon it immediately. However, in the effective use of reading as a means of study, in schools or colleges, the recording of information, usually by the making of notes, will be an essential part. Yet it appears that even for students in higher education, who have presumably developed effective ways of studying, instruction in strategies for recording information is minimal or non-existent (Wray, 1985). There is a strong argument for the teaching of these strategies, especially note-making, early on in children's school careers (Neate, 1992).

In our attempts to develop effective teaching strategies in this area we have been strongly guided by two principles. One of these concerns the need to consider information recording as inextricably linked to purpose for reading. It would make little sense to teach children to take notes as they consult information sources without giving consideration to why they will need these notes and to why they are looking for this information in the first place. To neglect the link between purpose and recording is to risk leaving children in the position of feeling that they have to note down all the information they read which is in the least bit relevant. Sometimes, of course, this will seem to be all the information and note-making descends to the level of copying.

The second principle which has guided us has been that, although skilful adult note-makers might well develop their own note structures to fit particular purposes and texts, younger students will need their initial attempts at note-making quite heavily scaffolded by structures suggested by their teachers. We

have been experimenting here with a range of grids and frames to provide this scaffolding (see Lewis, Wray & Rospigliosi, 1994a; 1994b) and have found some evidence that children can begin to make their own decisions about note-making as they see for themselves the usefulness of guiding structures.

8. Evaluating information.

In the light of the "information explosion" we are currently witnessing, with the sheer amount of textually stored information growing exponentially far beyond an individual's capacity even to be aware of its existence, it seems even more important that we try to develop in children a questioning attitude to what they read. Many adults retain an inherent propensity to believe that "if it says it in print, it must be true", yet most would accept that it would not be good for children to be taught to believe everything they read. A useful definition of literacy claims that it involves "having mastery over the processes by means of which culturally significant information is coded " (de Castell & Luke, 1986: 88) If this is accepted it implies that the literate person, far from being controlled by the manifestations of literacy, should, in fact, be in control of them. This involves having some autonomy in the process of using literacy, and having the ability to make choices. Propaganda and publicity rely for their effect upon recipients' lack of autonomy, and their sometimes overpowering influence upon the choices made.

Developing the abilities, and willingness, of children to be critical of what they read will involve encouraging them to use a variety of criteria to judge the accuracy, relevance, and status of the information they find. Children will naturally tend to believe that everything they read in books written by adults who know a great deal more than them about a particular topic is bound to be true. Yet they will constantly come across examples of misleading, incorrect, intentionally or unintentionally biased information, and they need to know how to recognise this and what to do about it.

We suggest that one teaching strategy to deliberately develop this questioning attitude is for the teacher deliberately to confront children with examples of out of date, biased or contradictory written material and to encourage them to discuss these features explicitly. Obvious possibilities for this include dated books, different newspaper reports on the same events and advertising material. In leading this discussion the teacher can provide a model of how he/she goes about evaluating what is read.

9. Assisting memory.

Although more recent psychological research into memory has suggested that this is a good deal more complex than we might at first think, one very influential way of examining memory has been to look closely at its corollary, forgetting. Experiments have revealed that we tend to forget the majority of the facts we try

to learn by heart within about 24 hours. Our rate of forgetting then slows down considerably and we may maintain our memory of the residue for a much longer period (Ebbinghaus, 1966). Such insights do not provide much cause for confidence that children's location of information in texts will have much long term impact upon their knowledge, a somewhat depressing suggestion for heavily content-based curriculum areas such as history and geography. Other research has, however, made it clear that there are factors which can influence memory and forgetting and which can positively inform teaching strategies (Child, 1973).

Firstly, it seems that the more meaningful the information we are trying to remember, the more likely we are to retain it for a longer period. Meaningful information is information which the learner can make sense of, that is, can 'fit' somewhere in a mental map of that part of the cognitive world. This re-emphasises the importance of attempting to bring to the foreground learners' previous knowledge which, as we suggested earlier, is the key to effective learning.

Secondly, remembering is improved by revisiting the information one is trying to remember. This is well known by teachers who often, in secondary classrooms at least, explicitly ask their pupils to 'revise' material. Often, however, this revision may be too far removed from the initial learning and can turn into an almost complete re-learning. In our work with teachers we have suggested strongly that children need to be given plenty of opportunities to work with information if they are to remember much of it for longer than a few days. This may involve restructuring information into different formats, re-presenting it to other people and using it in different contexts.

10. Communicating information.

In many adult information-using experiences, telling other people what has been found is not an important part of the process simply because the outcome may well be some kind of personal action rather than a report of whatever kind. Yet in educational contexts physical outcomes, usually written, are almost invariably expected of children as part of their work with information texts. As we have just argued this can be a benefit in helping children make the information they are working with more their own, and thus retained for longer. Yet there is some concern that children are often fairly limited in the kind of written outcomes they produce as a result of work with information.

For one group of theorists (e.g. Martin, 1985; Christie, 1985) this problem is defined as one of genres, by which they mean particular textual structures fitting particular communicative purposes. They argue that the vast majority of children's non-fiction writing is actually a form of recount, that is, they simply tell the story of what they have done and found out about a topic. There are a range of other written genres, far more common and useful in adult life, such as reports, discussion papers, arguments, which children are hardly ever encouraged, or taught, to produce.

If this line of argument has any merit (and it is fair to say that this is disputed ground), then teachers need to give more attention to enabling their children to communicate what they have discovered and learnt through work with texts in a wider range of textual forms. We have been working quite intensively on the idea of using framework written structures to help children experience a range of ways of presenting information and ideas. These seem to act as a form of scaffolding for children's non-fiction writing and we have some evidence that children begin to take the structures and use them spontaneously for their own purposes.

There are also, of course, a wide range of other creative ways of responding to non-fiction texts through, for example, drama, mime, book-making, oral presentation, two and three dimensional modelling and the writing of fictional narratives. We have to bear in mind that in the complex process of coming to terms with information, creative story-making around this information is a very important strategy.

Conclusion

The purpose of this paper has been to outline the theoretical basis on which we have been trying to develop teaching strategies to help children respond more effectively to information texts. Although we have been at pains to stress the difficulties in devising models of this nature, we have found that the teachers with whom we have worked have reacted positively to this attempt to provide a framework for their classroom work. We offer it here as a starting point for readers' own deliberations about the nature and teaching of reading for information. We should be very pleased to receive any reactions to anything we have said.

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